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ABSTRACT

This document contains the occupational duty/task lists for three occupations in the electronics series. Each occupation is divided into a number of duties. A separate page for each duty in the occupation lists the tasks in that duty along with its code number and columns to indicate whether that particular duty has been taught and to provide space for comments. The occupations are electronics technician, electronics assembler, and electronics mechanic. The occupational duty/task lists are the result of an extensive two-step development process in which information on current occupational requirements was gathered from such sources as consortia, trade associations, and current curriculum materials and was then synthesized by industry representatives, vocational instructors, and state-level representatives. (KC)

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DUTY TASK LIST

ELECTRONICS TECHNICIAN
ELECTRONICS ASSEMBLER
ELECTRONICS MECHANIC

CE051530

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OKLAHOMA OCCUPATIONAL TESTING CENTER

OKLAHOMA OCCUPATIONAL TESTING CENTER

INTRODUCTION:

Today's vocational instructors and administrators are faced with a myriad of important questions. They are searching for methods of providing accountability for students' acquisition of knowledge and skills as related to a constantly changing job market.

The Oklahoma Occupational Testing Center is in the business of eliminating some of the guesswork in answering today's tough questions. The professional staff, using a thorough and valid methodology, has developed duty/task lists for over 150 occupations in vocational education. Additional occupational duty/task lists will be made available as development is completed. These duty/task lists will help answer the following questions:

- Are students being prepared for today's jobs?
- What should today's vocational instructors be teaching?
- Is the curriculum addressing industry needs and is it up-to-date?
- How can vocational programs be improved?
- What in-service programs are needed for instructors?

BACKGROUND:

The occupational duty/task lists are the result of an extensive development process. Information regarding the occupational skills needed for employment is gathered from a number of sources such as consortia, trade associations, and current curriculum materials. This information is then synthesized by: 1) industry representatives, 2) vocational instructors, and 3) state level vocational representatives. The end result is a listing of occupations and the specific duties and tasks within each occupation. After dissemination for field review a committee of industry and vocational representatives revise the duty/task list to its final form.

USES:

The Oklahoma Occupational Testing Center's Duty/Task Lists are designed to be of value to a vocational program in several ways:

- Improving program planning
- Documenting industrial standards
- Evaluating curriculum and instruction
- Tracking individualized instruction*
- Using as a discussion tool with advisory committees
- Developing up-to-date job descriptions
- Performing self-evaluations
- Performing administrative program evaluations

INFORMATION:

To find out more about the Oklahoma Occupational Testing Center, call toll free:
1-800-654-4502.
Ask for our free catalog, listing over 150 occupations for which duty/task lists are available. CIMC curriculum materials related to these lists may also be available.

*A Progress Chart is provided for tracking individualized instruction.

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Oklahoma Occupational Testing Center

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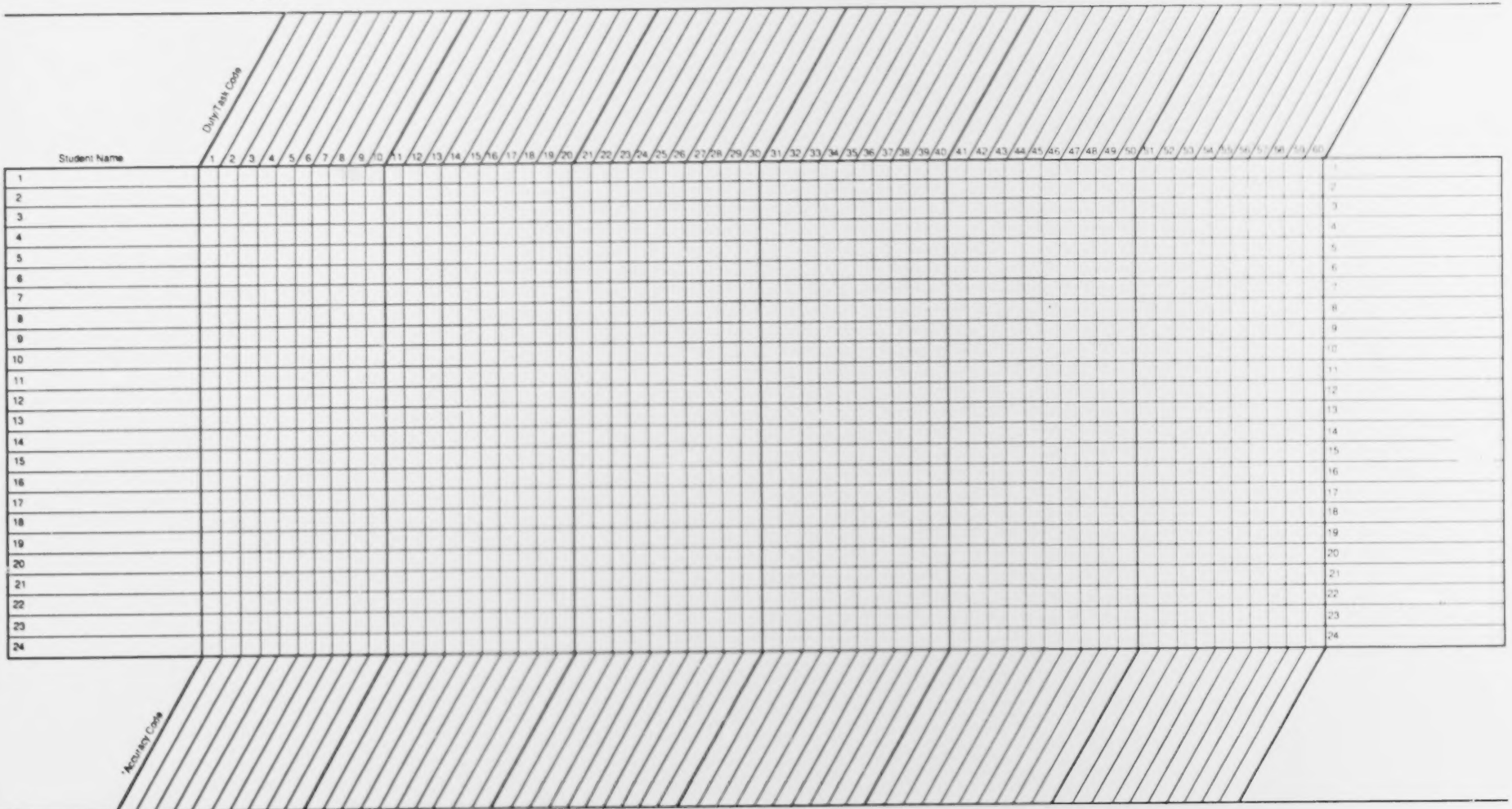
PROGRESS CHART

OKLAHOMA OCCUPATIONAL TESTING CENTER

Program

Oklahoma State Department of Vocational and Technical Education

Date



* 0 = No exposure - no information nor practice provided during training program; complete training required.
1 = Exposure only - general information provided with no practice time; close supervision needed and additional training required.
2 = Limited practice - has practiced during training program; additional training is required to develop skill.
3 = Moderately skilled - has performed independently during training program; limited additional training may be required.
4 = Skilled - can perform independently with no supervision.

This chart may be duplicated as needed.

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DUTY/TASK LISTS

ELECTRONICS SERIES

OCCUPATIONS:

1. Electronics Technician
2. Electronics Assembler
3. Electronics Mechanic

OKLAHOMA OCCUPATIONAL TESTING CENTER

DUTY/TASK LIST

ELECTRONICS SERIES

OCCUPATION 1: ELECTRONICS TECHNICIAN

DUTIES:

A. Apply Fundamentals of Direct Current
B. Apply Fundamentals of Alternating Current
C. Construct or Repair Power Supply Circuits
D. Test and Analyze Circuit Components
E. Construct or Repair Circuits with Special Semi-Conductor Diodes
F. Construct or Repair Transistor Circuits
G. Construct or Repair Amplifier Circuits
H. Test and Analyze Logic Devices
I. Apply Shop Organization and Safety Principles
J. Apply Mathematic Calculations

OKLAHOMA OCCUPATIONAL TESTING CENTER

OCCUPATION: **ELECTRONICS TECHNICIAN**

DUTY: **Apply Fundamentals of Direct Current**

CODE	TASK	TAUGHT	COMMENTS
A.01	Construct a basic circuit from a schematic		
A.02	Perform soldering and circuit fabrication		
A.03	Measure circuit resistance with an analogue and digital multi-meter		
A.04	Measure voltage with an analogue and digital multi-meter		
A.05	Measure current with an analogue and digital multi-meter		
A.06	Compute power		
A.07	Distinguish between conductors, semi-conductors, and insulators		
A.08	Analyze series circuits		
A.09	Perform circuit analysis for parallel circuits		
A.10	Analyze series-parallel circuits		
A.11	Evaluate a simple electro-magnet		
A.12	Analyze a DC motor and generator		
A.13	Recognize the difference between Thevenin and Norton equivalent circuits		

OCCUPATION: **ELECTRONICS TECHNICIAN**

DUTY: **Apply Fundamentals of Alternating Current**

CODE	TASK	TAUGHT	COMMENTS
B.01	Analyze a simple AC motor and generator		
B.02	Determine transformer ratios		
B.03	Solve for values of an operating RC/RL circuit		
B.04	Test capacitors with an ohmmeter		
B.05	Construct RL/RC time constant circuit		
B.06	Analyze series RCL circuits		
B.07	Analyze parallel RCL circuits		
B.08	Analyze conditions of maximum power transfer and power factors		
B.09	Demonstrate ability to measure an AC wave form using oscilloscope		

OCCUPATION: ELECTRONICS TECHNICIAN

DUTY: Construct or Repair Power Supply Circuits

CODE	TASK	TAUGHT	COMMENTS
C.01	Calculate average DC, ripple factor voltage, and percent regulation in half-wave rectifier and full-wave rectifier circuits		
C.02	Construct and analyze a half-wave rectifier circuit		
C.03	Construct and analyze a full-wave rectifier circuit		
C.04	Construct and analyze a voltage doubler circuit		
C.05	Use an ohmmeter to determine the anode and cathode of diodes		
C.06	Test for defective diodes		
C.07	Analyze AC to DC power supply for proper operation		
C.08	Analyze the operation of a bridge rectifier		
C.09	Construct and analyze a silicon-controlled rectifier power controlled circuit		
C.10	Construct and analyze a Triac power controlled circuit		

OCCUPATION: ELECTRONICS TECHNICIAN

DUTY: Test and Analyze Circuit Components

CODE	TASK	TAUGHT	COMMENTS
D.01	Test and accept/reject, replace/repair, cells		
D.02	Test and accept/reject, replace/repair, lamps		
D.03	Test and accept/reject, replace/repair, switches		
D.04	Test and accept/reject, replace/repair, resistors		
D.05	Test and accept/reject, replace/repair, wires and cables		
D.06	Test and accept/reject, replace/repair, fuses and breakers		
D.07	Test and accept/reject, replace/repair, capacitors		
D.08	Test and accept/reject, replace/repair, relay		
D.09	Test and accept/reject, replace/repair, coils		
D.10	Test and accept/reject, replace/repair, transformers		
D.11	Test and accept/reject, replace/repair, solenoid		
D.12	Test and accept/reject, replace/repair, a thermistor or varistor		

OCCUPATION: **ELECTRONICS TECHNICIAN**

DUTY: **Construct or Repair Circuits with Special Semi-Conductor Diodes**

CODE	TASK	TAUGHT	COMMENTS
E.01	Test operating characteristics of a tunnel diode circuit		
E.02	Test for proper operation of a photo diode circuit		
E.03	Construct and analyze a zener diode voltage regulator circuit		
E.04	Construct and analyze an LED circuit		
E.05	Test and analyze (troubleshoot) the operation of a silicon-controlled rectifier circuit		
E.06	Test and analyze (troubleshoot) the operation of a Triac circuit		
E.07	Test and analyze (troubleshoot) the operation of a Diac circuit		
E.08	Test and analyze (troubleshoot) a complementary metal oxide semi-conductor circuit (CMOS)		
E.09	Test and analyze analogue integrated circuits		

OCCUPATION: **ELECTRONICS TECHNICIAN**

DUTY: **Construct or Repair Transistor Circuits**

CODE	TASK	TAUGHT	COMMENTS
F.01	Identify the basic types of transistor circuits		
F.02	Compute voltage, current, and power stage gain		
F.03	Identify and test a common-emitter circuit		
F.04	Identify and test a common-collector circuit		
F.05	Identify and test a common-base circuit		
F.06	Test and analyze transistor circuit failures		
F.07	Test and analyze oscillator circuits		
F.08	Test and analyze a field-effect transistor circuit		
F.09	Test and analyze a junction field-effect transistor circuit		
F.10	Test and analyze (troubleshoot) the operation of a unijunction transistor		
F.11	Test and analyze (troubleshoot) the operation of a programmable unijunction transistor		
F.12	Test and accept/reject semi-conductor devices (transistors, SCR, UJT, etc.)		

OCCUPATION: **ELECTRONICS TECHNICIAN**

DUTY: **Construct or Repair Amplifier Circuits**

CODE	TASK	TAUGHT	COMMENTS
G.01	Analyze and adjust a voltage divider network to specification		
G.02	Analyze and test an amp circuit as to the effect bias will have on class of operation		
G.03	Locate the Q point, saturation point, and cutoff point in a common-emitter class A amplifier circuit		
G.04	Construct a load-line for a common-emitter amplifier circuit		
G.05	Test and/or construct a single-ended amplifier circuit		
G.06	Test and/or construct a push-pull amplifier circuit		
G.07	Test and/or construct a two-stage amplifier circuit		
G.08	Test and/or construct a basic Darlington pair amplifier circuit		
G.09	Test and construct an inverting amplifier circuit		
G.10	Test and construct a noninverting amplifier circuit		
G.11	Test and construct a DC summing inverting amplifier circuit		
G.12	Test and construct a differential amplifier circuit		
G.13	Test and analyze IC op-amp circuits		

OCCUPATION: ELECTRONICS TECHNICIAN

DUTY: Test and Analyze Logic Devices

CODE	TASK	TAUGHT	COMMENTS
H.01	Test and analyze an IC "AND" gate circuit		
H.02	Test and analyze an IC "OR" gate circuit		
H.03	Test and analyze an IC "NAND" gate circuit		
H.04	Test and analyze an IC "Exclusive-OR" gate circuit		
H.05	Test and analyze an IC "NOR" gate circuit		
H.06	Test and analyze an IC "Exclusive-NOR" gate circuit		
H.07	Test and analyze an IC "NOT" gate circuit		
H.08	Identify multivibrators given their input and output signal wave forms		
H.09	Test and analyze a four-bit shift register		

OCCUPATION: **ELECTRONICS TECHNICIAN**

DUTY: **Apply Shop Organization and Safety Principles**

CODE	TASK	TAUGHT	COMMENTS
I.01	Maintain a clean, safe work environment		
I.02	Maintain hand tools, electrical and non-electrical equipment		
I.03	Troubleshoot electronic components safely		
I.04	Calibrate and adjust instruments for daily work		
I.05	Demonstrate proper use of delicate electronic equipment		
I.06	Know limitations of test equipment		
I.07	Maintain safe personal work habits (NO horse-play)		

OCCUPATION: ELECTRONICS TECHNICIAN

DUTY: Apply Mathematic Calculations

CODE	TASK	TAUGHT	COMMENTS
J.01	Apply basic scientific calculations		
J.02	Apply basic algebraic calculations		
J.03	Apply basic trigonometry calculations		
J.04	Apply basic binary calculations		
J.05	Apply basic boolean algebra calculations		
J.06	Apply basic hexadecimal calculations		
J.07	Apply basic octal calculations		
J.08	Apply basic logarhythm calculations		

DUTY/TASK LIST

ELECTRONICS SERIES

OCCUPATION 2: ELECTRONICS ASSEMBLER

DUTIES:

A. Apply Fundamentals of Direct Current
B. Apply Fundamentals of Alternating Current
C. Construct or Repair Power Supply Circuits
D. Test and Analyze Circuit Components
E. Construct or Repair Circuits with Special Semi-Conductor Diodes
F. Construct or Repair Transistor Circuits
G. Construct or Repair Amplifier Circuits
I. Apply Shop Organization and Safety Principles
J. Apply Mathematic Calculations

OKLAHOMA OCCUPATIONAL TESTING CENTER

OCCUPATION: **ELECTRONICS ASSEMBLER**

DUTY: **Apply Fundamentals of Direct Current**

CODE	TASK	TAUGHT	COMMENTS
A.01	Construct a basic circuit from a schematic		
A.02	Perform soldering and circuit fabrication		
A.03	Measure circuit resistance with an analogue and digital multi-meter		
A.04	Measure voltage with an analogue and digital multi-meter		
A.05	Measure current with an analogue and digital multi-meter		
A.07	Distinguish between conductors, semi-conductors, and insulators		

OCCUPATION: ELECTRONICS ASSEMBLER

DUTY: Apply Fundamentals of Alternating Current

CODE	TASK	TAUGHT	COMMENTS
B.04	Test capacitors with an ohmmeter		

OCCUPATION: ELECTRONICS ASSEMBLER

DUTY: Construct or Repair Power Supply Circuits

CODE	TASK	TAUGHT	COMMENTS
C.02	Construct and analyze a half-wave rectifier circuit		
C.03	Construct and analyze a full-wave rectifier circuit		
C.05	Use an ohmmeter to determine the anode and cathode of diodes		
C.06	Test for defective diodes		
C.07	Analyze AC to DC power supply for proper operation		

OCCUPATION: **ELECTRONICS ASSEMBLER**

DUTY: **Test and Analyze Circuit Components**

CODE	TASK	TAUGHT	COMMENTS
D.01	Test and accept/reject, replace/repair, cells		
D.02	Test and accept/reject, replace/repair, lamps		
D.03	Test and accept/reject, replace/repair, switches		
D.04	Test and accept/reject, replace/repair, resistors		
D.05	Test and accept/reject, replace/repair, wires and cables		
D.06	Test and accept/reject, replace/repair, fuses and breakers		
D.07	Test and accept/reject, replace/repair, capacitors		
D.08	Test and accept/reject, replace/repair, relay		
D.09	Test and accept/reject, replace/repair, coils		
D.10	Test and accept/reject, replace/repair, transformers		
D.11	Test and accept/reject, replace/repair, solenoid		
D.12	Test and accept/reject, replace/repair, a thermistor or varistor		

OCCUPATION: **ELECTRONICS ASSEMBLER**

DUTY: **Construct or Repair Circuits with Special Semi-Conductor Diodes**

CODE	TASK	TAUGHT	COMMENTS
E.03	Construct and analyze a zener diode voltage regulator circuit		
E.04	Construct and analyze an LED circuit		

OCCUPATION: **ELECTRONICS ASSEMBLER**

DUTY: **Construct or Repair Transistor Circuits**

CODE	TASK	TAUGHT	COMMENTS
F.01	Identify the basic types of transistor circuits		

OCCUPATION: ELECTRONICS ASSEMBLER

DUTY: Construct or Repair Amplifier Circuits

CODE	TASK	TAUGHT	COMMENTS
G.05	Test and/or construct a single-ended amplifier circuit		
G.06	Test and/or construct a push-pull amplifier circuit		
G.07	Test and/or construct a two-stage amplifier circuit		
G.08	Test and/or construct a basic Darlington pair amplifier circuit		
G.09	Test and construct an inverting amplifier circuit		
G.10	Test and construct a noninverting amplifier circuit		
G.11	Test and construct a DC summing inverting amplifier circuit		
G.12	Test and construct a differential amplifier circuit		
G.13	Test and analyze IC op-amp circuits		

OCCUPATION: **ELECTRONICS ASSEMBLER**

DUTY: **Apply Shop Organization and Safety Principles**

CODE	TASK	TAUGHT	COMMENTS
I.01	Maintain a clean, safe work environment		
I.02	Maintain hand tools, electrical and non-electrical equipment		
I.03	Troubleshoot electronic components safely		
I.04	Calibrate and adjust instruments for daily work		
I.05	Demonstrate proper use of delicate electronic equipment		
I.06	Know limitations of test equipment		
I.07	Maintain safe personal work habits (NO horse-play)		

OCCUPATION: ELECTRONICS ASSEMBLER

DUTY: Apply Mathematic Calculations

CODE	TASK	TAUGHT	COMMENTS
J.01	Apply basic scientific calculations		
J.02	Apply basic algebraic calculations		
J.03	Apply basic trigonometry calculations		

DUTY/TASK LIST

ELECTRONICS SERIES

OCCUPATION 3: ELECTRONICS MECHANIC

DUTIES:
- A. Apply Fundamentals of Direct Current
- B. Apply Fundamentals of Alternating Current
- C. Construct or Repair Power Supply Circuits
- D. Test and Analyze Circuit Components
- I. Apply Shop Organization and Safety Principles
- J. Apply Mathematic Calculations

OKLAHOMA OCCUPATIONAL TESTING CENTER

OCCUPATION: ELECTRONICS MECHANIC

DUTY: Apply Fundamentals of Direct Current

CODE	TASK	TAUGHT	COMMENTS
A.01	Construct a basic circuit from a schematic		
A.02	Perform soldering and circuit fabrication		
A.03	Measure circuit resistance with an analogue and digital multi-meter		
A.04	Measure voltage with an analogue and digital multi-meter		
A.05	Measure current with an analogue and digital multi-meter		
A.07	Distinguish between conductors, semi-conductors, and insulators		
A.12	Analyze a DC motor and generator		

OCCUPATION: **ELECTRONICS MECHANIC**

DUTY: **Apply Fundamentals of Alternating Current**

CODE	TASK	TAUGHT	COMMENTS
B.01	Analyze a simple AC motor and generator		
B.02	Determine transformer ratios		
B.04	Test capacitors with an ohmmeter		

OCCUPATION: **ELECTRONICS MECHANIC**

DUTY: **Construct or Repair Power Supply Circuits**

CODE	TASK	TAUGHT	COMMENTS
C.05	Use an ohmmeter to determine the anode and cathode of diodes		
C.06	Test for defective diodes		
C.07	Analyze AC to DC power supply for proper operation		

OCCUPATION: **ELECTRONICS MECHANIC**

DUTY: **Test and Analyze Circuit Components**

CODE	TASK	TAUGHT	COMMENTS
D.01	Test and accept/reject, replace/repair, cells		
D.02	Test and accept/reject, replace/repair, lamps		
D.03	Test and accept/reject, replace/repair, switches		
D.04	Test and accept/reject, replace/repair, resistors		
D.05	Test and accept/reject, replace/repair, wires and cables		
D.06	Test and accept/reject, replace/repair, fuses and breakers		
D.07	Test and accept/reject, replace/repair, capacitors		
D.08	Test and accept/reject, replace/repair, relay		
D.09	Test and accept/reject, replace/repair, coils		
D.10	Test and accept/reject, replace/repair, transformers		
D.11	Test and accept/reject, replace/repair, solenoid		
D.12	Test and accept/reject, replace/repair, a thermistor or varistor		

OCCUPATION: **ELECTRONICS MECHANIC**

DUTY: **Apply Shop Organization and Safety Principles**

CODE	TASK	TAUGHT	COMMENTS
I.01	Maintain a clean, safe work environment		
I.02	Maintain hand tools, electrical and non-electrical equipment		
I.03	Troubleshoot electronic components safely		
I.04	Calibrate and adjust instruments for daily work		
I.05	Demonstrate proper use of delicate electronic equipment		
I.06	Know limitations of test equipment		
I.07	Maintain safe personal work habits (NO horse-play)		

OCCUPATION: **ELECTRONICS MECHANIC**

DUTY: **Apply Mathematic Calculations**

CODE	TASK	TAUGHT	COMMENTS
J.01	Apply basic scientific calculations		
J.02	Apply basic algebraic calculations		